Attorney Docket No. ATI-291

UNITED STATES PATENT AND TRADEMARK OFFICE

Examiner: Toan C. To		Art Unit: 3616
Re:	Application of:	David S. Breed et al.
	Serial No.:	10/058,706
	Filed:	January 28, 2002
	For:	Vehicular Occupant Characteristic Determination System and Method
	Confirmation No.:	7750
	Customer Number:	22846

SUBSTITUTE APPEAL BRIEF UNDER 37 C.F.R. §41.67

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

July 24, 2006

Dear Sir:

On January 21, 2005, appellants, through their attorney, filed a Notice of Appeal appealing the final rejections of claims 1-5, 7-21, 23 and 24 set forth in an Office Action dated August 25, 2004 for the above-referenced application. The Notice of Appeal was received on January 24, 2005, and an Appeal Brief was timely filed March 24, 2005.

A Notification of Non-Compliant Appeal Brief was mailed July 21, 2006 indicating several informalities in the Appeal Brief. This Substitute Appeal Brief is therefore being submitted as a substitute for the originally filed Appeal Brief. For the reasons set forth below, it is still believed that the rejections in the Office Action dated should be reversed.

A. REAL PARTY IN INTEREST

The real party in interest of the above-identified application is Automotive Technologies International, Inc., by virtue of an assignment of 100% interest in the application by the inventor-appellants.

B. RELATED APPEALS AND INTERFERENCES.

At this time, there are no related appeals or interferences.

C. STATUS OF CLAIMS

Claims 1-24 are pending in this application. Claims 6 and 22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claims 1-5, 7-21, 23 and 24 have been rejected. Appellants are therefore appealing the final rejections of these claims.

Claim 1 is an independent claim upon which claims 2-5 and 7-14 depend directly or indirectly, claim 15 is a second independent claim upon which claims 16-21 depend directly or indirectly, claim 23 is a third independent claim and claim 24 is a fourth independent claim. The text of the claims on appeal is found in the Claims Appendix.

D. STATUS OF AMENDMENTS

An Amendment Under 37 C.F.R. §1.116 was filed on December 27, 2004. An Advisory Action mailed January 18, 2005 did not indicate that the Amendment would or would not be entered for the purposes of Appeal. In view of the changes set forth in the Amendment, it is believed that the Amendment would be entered.

E. SUMMARY OF CLAIMED SUBJECT MATTER

The present invention as defined in claim 1 relates to a sensor system for sensing at least one occupant characteristic of a vehicle occupant (such as presence, size, location, type) which includes (transmitting) means for transmitting an energy signal toward an occupant location within a vehicle, (detecting) means for detecting whether absorption of the energy signal by a vehicle occupant occurs and for providing an absorption signal indicative thereof, and (processing) means for processing the absorption signal to determine at least one occupant characteristic. Appellants' use of "means plus function" language for several features of claim 1 requires that these features be construed according to 35 U.S.C. §112, sixth paragraph, and that appellants set forth the structure, material or acts described in the specification as corresponding to each claimed function with reference to the specification by page and line numbers and to the drawings by reference characters (37 C.F.R. §41.37 (c)(1)(v)).

Accordingly, the transmitting means may comprise a transducer 132 which transmits ultrasonic energy (one form of energy) toward the front passenger seat (an occupant location within a vehicle)-see Fig. 1 and page 15, lines 26-28. The detecting means may comprise ultrasonic transducers 131, 133 which receive ultrasonic waves modified by the presence of an object in the front passenger seat-Fig. 1, page 15, lines 28-30. Alternatively, the transducers 131, 132, 131 may each be any type of wave-transmitting transducer or radiation-receiving transducer (see Fig. 1 and page 15, lines 21-22). It is known to those skilled in the art that in view of the use of waves or radiation, both forms of energy, some of the energy waves or radiation are absorbed by the occupant or other object in the front passenger seat, such as a rear-facing child seat. The processing means may be a processor 101 which determines the position of the occupant based on the reflected ultrasonic waves (Fig. 1 and page 15, lines 34-36).

In addition to the structure, material and acts corresponding to the means set forth in claim 1 mentioned above with reference to Fig. 1 and page 26, lines 21-36, additional means are disclosed with reference to Fig. 18 and page 33, lines 7-28. Fig. 18 shows transducers 231A, 232A, 233A, of which transducer 231A transmits infrared energy toward the occupant location and the infrared energy modified

by the presence of an occupant in the occupant location is detected by transducers 231A, 232A, 233A which are sensitive to infrared radiation (see page 33, lines 7-28). Transducers 231A, 232A, 233A generate a signal indicative of the absorption of the infrared energy transmitted by transducer 231A. Processor 101 determines an occupant characteristic, i.e., the presence and appearance of the occupant, to ascertain whether the occupant's appearance is similar to the appearance of an occupant authorized to operate the vehicle.

The present invention as defined in claim 15 relates to a method for sensing at least one occupant characteristic of a vehicle occupant, comprising transmitting an energy signal toward an occupant location within a vehicle, detecting whether absorption of the energy signal by a vehicle occupant occurs, providing an absorption signal indicative of the occurrence of energy absorption, and processing the absorption signal to determine at least one occupant characteristic. Transmission of an energy signal toward the occupant location within a vehicle can be achieved by transducer 132 (see Fig. 1). Detection of absorption of the energy signal and providing a signal indicative thereof can be achieved by transducers 131 and 133 which receive waves or radiation dependent on the presence or absence of the occupant and properties of the occupant when present. A processor 101 processes the absorption signal to determine, e.g., occupant position, based on the reflected waves or received radiation.

Claim 23 relates to a system similar to claim 1 but in which separate means are present for providing the absorption signal and for detecting whether absorption of the energy signal occurs. Appellants' use of "means plus function" language for several features of claim 23 requires that these features be construed according to 35 U.S.C. §112, sixth paragraph and that appellants set forth the structure, material or acts described in the specification as corresponding to each claimed function with reference to the specification by page and line numbers and to the drawings by reference characters.

The transmitting means may comprise a transducer 132 which transmits ultrasonic energy (one form of energy) toward the front passenger seat (an occupant location within a vehicle)-see Fig. 1 and page 15, lines 26-28. The detecting means and providing means may each comprise one or more

ultrasonic transducers 131, 133 or component thereof which receive ultrasonic waves modified by the presence of an object in the front passenger seat-page 15, lines 28-30. The detecting means would be that part of the ultrasonic transducer which receives the modified ultrasonic waves and determines that the transmitted waves differ from the received waves whereas the providing means would be that part of the ultrasonic transducer which converts the difference into a signal based thereon. Alternatively, the transducers 131, 132, 131 may each be any type of wave-transmitting transducer or radiation-receiving transducer (see page 15, lines 21-22). It is known to those skilled in the art that in view of the use of waves or radiation, both forms of energy, some of the energy waves or radiation are absorbed by the occupant or other object in the front passenger seat, such as a rear-facing child seat. The processing means may be a processor 101 which determines the position of the occupant based on the reflected ultrasonic waves (page 15, lines 34-36).

In addition to the structure, material and acts corresponding to the means set forth in claim 1 mentioned above with reference to Fig. 1 and page 26, lines 21-36, additional means are disclosed with reference to Fig. 18 and page 33, lines 7-28. Fig. 18 shows transducers 231A, 232A, 233A, of which transducer 231A transmits infrared energy toward the occupant location and the infrared energy modified by the presence of an occupant in the occupant location is detected by transducers 231A, 232A, 233A which are sensitive to infrared radiation. Transducers 231A, 232A, 233A generate a signal indicative of the absorption of the infrared energy transmitted by transducer 231A. Processor 101 determines an occupant characteristic, i.e., the presence and appearance of the occupant, to ascertain whether the occupant's appearance is similar to the appearance of an occupant authorized to operate the vehicle.

Claim 24 relates to a method in which the absorption detection step and absorption signal providing step are combined. Transmission of an energy signal toward occupant location within a vehicle can be achieved by transducer 132 (see Fig. 1). Detection of absorption of the energy signal and providing a signal indicative thereof can be achieved by transducers 131 and 133 which receive waves or radiation dependent on the presence or absence of the occupant and properties of the occupant when

present. A processor 101 processes the absorption signal to determine, e.g., occupant position, based on the reflected waves or received radiation.

F. ISSUE TO BE REVIEWED ON APPEAL

The issue to be reviewed on this appeal is as follows:

Whether the rejection of claims 1-5, 7-21, 23 and 24 in view of Cooper et al. (U.S. Pat. No. 6,199,902) is appropriate in light of a claim of priority of the present application under 35 U.S.C. §120, i.e., whether Cooper et al. is available as prior art against the patentability of claims 1-5, 7-21, 23 and 24.

G. ARGUMENT

Claims 1-5, 7-21, 23 and 24 are rejected under 35 U.S.C. §102(b) as being anticipated by Cooper et al.

Cooper et al. should not be available as prior art against the patentability of claims 1-5, 7-21, 23 and 24 because the subject matter of these claims is supported in a parent application, U.S. patent application Ser. No. 09/047,703 (the '703 application) filed March 25, 1998, which predates the effective filing date of Cooper et al. (February 12, 1999). Priority of the '703 application has been properly claimed under 35 U.S.C. §120, through three intervening applications, namely U.S. patent application Ser. No. 09/437,535, U.S. patent application Ser. No. 09/563,556, and U.S. patent application Ser. No. 09/838,920, there is continuity of disclosure through these intervening applications, and there is at least one common inventor named in the instant application and the '703 application, i.e., David S. Breed.

As to support for the claimed subject matter in the '703 application, rejected independent claims 1, 15, 23 and 24 are set forth below in chart form with an indication of the disclosure thereof in the '703 application (reference being made to U.S. Pat. No. 6,039,139 which issued from the '703 application).

1. A sensor system for sensing at least one occupant characteristic of a vehicle occupant, comprising:	
means for transmitting a energy signal toward an occupant location within a vehicle;	In Fig. 1, means for transmitting an energy signal toward occupant location within a vehicle is transducer 132 (col. 11, lines 13-14). Transducer 132 is representative of any "wave-transmitting transducer or radiation-receiving receiver" (col. 11, lines 8-10). Transducer 132 may be replaced by a laser transducer (col. 15, lines 37-40).
means for detecting whether absorption of the energy signal by a vehicle occupant occurs and for providing an absorption signal indicative thereof; and	The means for detecting absorption and providing a signal indicative thereof are transducers 131 and 133 (col. 11, lines 16-17), which may be any wave-transmitting or radiation-receiving receiver or a laser transducer. Inherently, some of the transmitted waves or energy are absorbed by the occupant.
means for processing the absorption signal to determine at least one occupant characteristic.	The means for processing is a processor 101 which determine occupant position based on the reflected ultrasonic waves (col. 11, lines 27-29).
15. A method for sensing at least one occupant characteristic of a vehicle occupant, comprising the steps of:	
transmitting an energy signal toward an occupant location within a vehicle;	Transmission of an energy signal toward occupant location within a vehicle can be achieved by transducer 132 (col. 11, lines 13-14).
detecting whether absorption of the energy signal by a vehicle occupant occurs; providing an absorption signal indicative of the occurrence of energy absorption; and	Detection of absorption of the energy signal and providing a signal indicative thereof can be achieved by transducers 131 and 133 (col. 11, lines 16-17).
processing the absorption signal to determine at least one occupant characteristic.	A processor 101 processes the absorption signal to determine, e.g., occupant position, based on the reflected ultrasonic waves (col. 11, lines 27-29).

23. A sensor system for sensing at least one occupant characteristic of a vehicle occupant, comprising:	
means for transmitting an energy signal toward an occupant location within a vehicle;	In Fig. 1, means for transmitting an energy signal toward occupant location within a vehicle is transducer 132 (col. 11, lines 13-14). Transducer 132 is representative of any "wave-transmitting transducer or radiation-receiving receiver" (col. 11, lines 8-10). Transducer 132 may be replaced by a laser transducer (col. 15, lines 37-40).
means for detecting whether absorption of the energy signal by a vehicle occupant occurs; means for providing an absorption signal indicative of the occurrence of energy absorption; and	The means for detecting absorption and providing a signal indicative thereof are transducers 131 and 133 (col. 11, lines 16-17), which may be any wave-transmitting or radiation-receiving receiver or a laser transducer. Inherently, some of the transmitted waves or energy are absorbed by the occupant.
means for processing the absorption signal to determine at least one occupant characteristic.	The means for processing is a processor 101 which determine occupant position based on the reflected ultrasonic waves (col. 11, lines 27-29).
24. A method for sensing at least one occupant characteristic of a vehicle occupant, comprising the steps of:	
transmitting an energy signal toward an occupant location within a vehicle;	Transmission of an energy signal toward occupant location within a vehicle can be achieved by transducer 132 (col. 11, lines 13-14).
detecting whether absorption of the energy signal by a vehicle occupant occurs and providing an absorption signal indicative thereof; and	Detection of absorption of the energy signal and providing a signal indicative thereof can be achieved by transducers 131 and 133 (col. 11, lines 16-17).
processing the absorption signal to determine at least one occupant characteristic.	A processor 101 processes the absorption signal to determine, e.g., occupant position, based on the reflected ultrasonic waves (col. 11, lines 27-29).

In view of the foregoing chart (and another chart in the Amendment dated May 3, 2004 which sets forth the support for all of the rejected claims in the '139 patent), it is respectfully submitted that the subject matter of the rejected claims is sufficiently disclosed in the parent '703 application to be entitled to the benefit of the filing date thereof. The subject matter is also present in intervening U.S. patent

application Ser. No. 09/437,535, in intervening U.S. patent application Ser. No. 09/563,556, and in intervening U.S. patent application Ser. No. 09/838,920.

However, in the Office Action dated August 25, 2004, the Examiner took a position that the '139 patent does not support the subject matter of independent claims 1, 15, 23 and 24 because "the Examiner has seen no inherency that the ultrasonic waves could positively perform or disclose" the subject matter of the claims.

In response, it is pointed out that the claims are not limited to the transmission of ultrasonic waves and can encompass the transmission of various waves including, but not limited to, ultrasonic waves and electromagnetic waves. Rather, the '139 patent explicitly states that transducers 131-133 or alternatively transducers 231-233 may be any type of wave-transmitting/receiving transducers or radiation-receiving receivers including electromagnetic transducers (e.g., at col. 22, lines 2-4) and thus mention of ultrasonic transducers for transmitting and receiving waves does not limit the invention. Moreover, the '139 patent mentions the possibility of using several discrete frequencies or bands of frequencies to obtain greater information from the reflected waves (see col. 22, line 61 to col. 23, line 7). Ultrasonic frequencies fall in one band so that recitation of the use of different bands implies other frequency bands, such as the electromagnetic band mentioned in the specification, which undeniably results in absorption of the electromagnetic energy by the human body. Thus, the '139 patent discloses the use of electromagnetic frequencies in addition to or instead of ultrasonic frequencies for occupant monitoring.

As to the inherency of the absorption of an ultrasonic energy signal by a human being, the frequency of a transmitted energy signal affects the absorbability of the waves by water-containing objects such as human beings (see Cooper et al., col. 5, lines 26-47). When waves having a relatively high electromagnetic frequency impact the human body, the human body reflects a significant portion of the waves so that absorption of the waves is minimal or even nominal. However, as the frequency drops, more of the energy embodied by the waves passes through the human body and thus the absorption of the

wave energy is increased (while the reflected portion of wave energy decreases). Hence, the preferred waves in Cooper et al. are high frequency electromagnetic waves (HF EM).

Nevertheless, there is a direct correlation between the frequency of transmitted waves and reflectivity/absorbability of the waves by water-containing objects such as human beings. The higher reflectivity of waves equates to a lower absorption of the waves and vice versa.

In view of the relationship between reflectivity of waves and absorbability of the waves, whenever mention is made of the reflectivity of waves being detected and possibly subsequently quantified and analyzed to obtain information about the objects from which the waves have been reflected, it is inherent that a detection of whether absorption of the waves has occurred (as set forth in claims 1, 15, 23 and 24) is also being considered. Although the absorption of ultrasonic waves by the human body is less than the absorption of electromagnetic waves in view of the frequency difference, there is still absorption of ultrasonic waves.

A detection of whether absorption of the waves has occurred is a feature which flows as a matter of course from a detection of the reflected waves regardless of the frequency of the waves. The amount of absorption of the waves (reflected as energy) equals the amount of energy transmitted less the amount of energy scattered and less the amount of energy received. For example, once waves are transmitted, if no reflected waves are detected (all are absorbed or scattered), then it is clear that there is an object in the path of the transmitted waves (in the vehicle compartment) and that all of the transmitted waves have been absorbed by whatever object is in the path of the transmitted waves, or scattered. Similarly, if the reflected waves have substantially the same properties as the transmitted waves, it is likely that the waves did not encounter any object in their path which would absorb even a small part of the waves, i.e., no object is present in the vehicle compartment (scattering being minimal). Accordingly, a detection of whether absorption of a transmitted energy signal has occurred is equivalent to a detection of a reflected energy signal, and analysis thereof.

The feature of detecting and analyzing reflected waves is adequately disclosed in the '139 patent. Indeed, in the '139 patent, repeated disclosure is made of waves reflected by an occupant in a compartment of a vehicle being analyzed to obtain information about the occupant. In light of the analysis above relating to the relationship between reflectivity of waves and absorbability of waves, the absorption of waves by the occupant is also being analyzed in the sense that such absorption is detected (as reflected in the degree to which waves are reflected by the occupant) and an absorption signal indicative thereof is provided (a signal indicative of the reflectivity of the waves is also indicative of the absorbability of the waves).

In view of the foregoing, it is respectfully submitted that the subject matter of the pending claims is adequately disclosed the application which matured into the '139 patent, which has a filing date before that of Cooper et al.

As such, Cooper et al. should not be available as prior art and accordingly, the Examiner's rejection of claims 1-5, 7-21, 23 and 24 as being anticipated by Cooper et al. has been overcome and should be removed.

H. CONCLUSION

The subject matter of the rejected claims is disclosed in a parent application which expressly mentions the possibility of using different wave-transmitting and radiation-receiving receivers, and the relative absorption of waves or energy by an object in the wave or energy path, for the purposes of determining a characteristic of a vehicular occupant. Thus, the rejected claims are supported by the disclosure in this parent application, and since the parent application was filed prior to Cooper et al., Cooper et al. is not available as prior art.

Therefore, upon reason and authority, it is respectfully requested that the Board reverse the final rejection.

The fee of $250.00 for filing an Appeal Brief, appellants having qualified for small entity status, has already been paid.

An early and favorable action on the appeal is earnestly solicited.

FOR THE APPELLANTS
Respectfully submitted,

/Brian Roffe/

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CLAIMS APPENDIX

1. A sensor system for sensing at least one occupant characteristic of a vehicle occupant, comprising:

means for transmitting an energy signal toward an occupant location within a vehicle;

means for detecting whether absorption of the energy signal by a vehicle occupant occurs and for providing an absorption signal indicative thereof; and

means for processing the absorption signal to determine at least one occupant characteristic.

2. The system of claim 1, wherein said means for transmitting includes means for transmitting an electromagnetic energy signal toward the occupant location, and said means for detecting includes means for detecting absorption of the energy signal.

3. The system of claim 1, wherein said means for processing includes means for determining if a vehicle occupant is present as the occupant characteristic.

4. The system of claim 1, wherein said means for processing includes means for determining a size of a vehicle occupant as the occupant characteristic.

5. The system of claim 1, wherein said means for processing includes means for determining location of a vehicle occupant with respect to the vehicle as the occupant characteristic.

7. The system of claim 1, wherein said means for processing includes means for determining a type of a vehicle occupant as the occupant characteristic.

8. The system of claim 7, wherein said means for processing includes means for determining whether the type of a vehicle occupant is a child in a child seat.

9. The system of claim 1, wherein said means for transmitting and said means for detecting are arranged on a common side of the vehicle occupant location.

10. The system of claim 1, wherein said means for transmitting is a first means for transmitting and said energy signal is a first energy signal, said system including a plurality of means for transmitting, each for transmitting an energy signal toward the occupant location, said means for detecting includes means for detecting whether absorption of each energy signal by a vehicle occupant occurs and for providing signals indicative thereof.

11. The system of claim 10, wherein one of said plurality of means for transmitting is mounted within a headliner of the vehicle, and another of said plurality of means for transmitting is mounted within an instrument panel of the vehicle.

12. The system of claim 11, wherein one of said plurality of means for detecting is mounted within a door of the vehicle.

13. The system of claim 1, wherein said means for transmitting is mounted within a portion of the vehicle other than a headliner, and said means for detecting is mounted with a portion of the vehicle other than a seat of the vehicle.

14. The system of claim 1, wherein said means for processing includes means for providing a signal indicative of the at least one occupant characteristic for use within an occupant protection system.

15. A method for sensing at least one occupant characteristic of a vehicle occupant, comprising the steps of:

transmitting an energy signal toward an occupant location within a vehicle;

detecting whether absorption of the energy signal by a vehicle occupant occurs;

providing an absorption signal indicative of the occurrence of energy absorption; and

processing the absorption signal to determine at least one occupant characteristic.

16. The method of claim 15, wherein said step of transmitting includes transmitting an electromagnetic energy signal toward the occupant location, and said step of detecting includes detecting absorption of the energy signal.

17. The method of claim 15, wherein said step of processing includes determining if a vehicle occupant is present as the occupant characteristic.

18. The method of claim 15, wherein said step of processing includes determining a size of the vehicle occupant as the occupant characteristic.

19. The method of claim 15, wherein said step of processing includes determining a location of the vehicle occupant with respect to the vehicle as the occupant characteristic.

20. The method of claim 15, wherein said step of processing includes determining a type of the vehicle occupant as the occupant characteristic.

21. The method of claim 20, wherein said step of processing includes determining whether the type of vehicle occupant is a child in a child seat.

23. A sensor system for sensing at least one occupant characteristic of a vehicle occupant, comprising:

means for transmitting an energy signal toward an occupant location within a vehicle;

means for detecting whether absorption of the energy signal by a vehicle occupant occurs;

means for providing an absorption signal indicative of the occurrence of energy absorption; and

means for processing the absorption signal to determine at least one occupant characteristic.

24. A method for sensing at least one occupant characteristic of a vehicle occupant, comprising the steps of:

transmitting an energy signal toward an occupant location within a vehicle;

detecting whether absorption of the energy signal by a vehicle occupant occurs and providing an absorption signal indicative thereof; and

processing the absorption signal to determine at least one occupant characteristic.

EVIDENCE APPENDIX

Not applicable

RELATED PROCEEDINGS APPENDIX

Not applicable